

Course Guidelines and Description for Students

Introduction: This course is IB Mathematics Higher Level. This is a university level mathematics course that covers many different areas of pure mathematics including analysis, calculus, probability, statistics and discrete mathematics. The first year of this two-year course covers approximately 60% of the syllabus in order to leave time next year to review for the examination.

Text: The book that we will be primarily using is Mathematics for the IB Diploma Higher Level 1 and 2 by Quadling and Neill.

Homework: Homework is assigned unit by unit and it is the student's responsibility to keep up with the assignments. I recommend spending at least 45 minutes per night on mathematics alone. There are quizzes approximately once a week to verify that the homework is being done. Quizzes consist of problems copied directly from the textbook. Homework is posted on the class wiki: <http://genzerhlmath.wikispaces.com> as well as on Turnitin.com (class ID is 4107334 and the password is euler)

Tests: There are tests on the material for every unit. These tests are “IB Style” in that they will all either be actual IB questions from old exams or extremely similar to IB questions. Due to this, all tests will be graded on an IB Scale, i.e. curved (see attached).

Portfolios: The IB requires portfolio work as part of this course. There will be two portfolios sent to IB as the internal assessment grade. This constitutes 20% of the IB grade.

Grading: AISK uses holistic grade descriptors to obtain your grade. They are as follows:

A 90 to 100%	<ul style="list-style-type: none">- Maintains and exceeds AISK curriculum standards- Provides evidence of a high level of critical thinking and application of knowledge in a variety of tasks- Provides evidence of a high level of creative and/or innovative learning or understanding- Highly motivated and works independently
B 80 to 89%	<ul style="list-style-type: none">- Maintains and meets AISK curriculum standards- Provides evidence of a good level of critical thinking and application of knowledge in a variety of tasks- Provides evidence of a good level of creative and/or innovative learning or understanding- Usually motivated and works independently with occasional assistance
C 70 to 79%	<ul style="list-style-type: none">- Meets most AISK curriculum standards- Provides evidence of a moderate level of critical thinking and application of knowledge in a variety of tasks- Provides evidence of a moderate level of creative and/or innovative learning or understanding- Sometimes motivated and works independently with some assistance
D 60 to 69%	<ul style="list-style-type: none">- Meets level of some AISK curriculum standards- Provides minimal evidence of critical thinking and application of knowledge in a variety of tasks- Provides minimal evidence of creative and/or innovative learning or understanding- Little motivation and works independently with assistance
F 55 to 59%	<ul style="list-style-type: none">- Does not meet AISK curriculum standards- Provides insufficient evidence of critical thinking and application of knowledge in a variety of tasks- Provides insufficient evidence of creative and/or innovative learning or understanding- Not motivated and does not work independently

Formulae: You do not need to memorize many formulae in this course. A formula packet will be given to you during our first class. You may use it at any time. Clean ones will be given to you for examinations.

Supplies: You will need some kind of notebook for this class. I do not care what kind, nor whether you use paper or electronic. You will also need something to write with, and a Texas Instruments TI-83 Plus or TI-84 Plus graphing calculator. Please bring it every day.

Academic Honesty: Please note that you must abide by the AISK Code of Conduct in this class, which includes clear guidelines about academic honesty. You can find details on page pp. 14-15 of the MS/HS Handbook. You must also abide by the IB Academic Honesty policies which will be given to you by your IB Coordinator (me).

Signatures: As homework is neither collected nor graded, no homework signatures will be given for missing homework. However quiz and test grades will be posted on PowerSchool which students and parents can see. In addition, uniform signatures will be given for any uniform infraction and tardy signatures for any tardiness. If you come late to class from another teacher who let you out late, you must come with a note from that teacher.

Extra Help: I am available for extra help but please make arrangements with me ahead of time. If you agree on a date and time, please be on time.

Contact: I am always available to meet with students and parents. Please email me at sgenzer@aisk.com or drop by my office any time.

IB Mathematics Higher Level Syllabus – Year 1

Unit 1: Arithmetic and geometric sequences and series, sigma notation (Std. 1.1)

Unit 2: Review of algebra and polynomials, graphical approach of solving equations (Std. 2.2), solution of quadratic equations and use of the discriminant (Std. 2.6), Factor and remainder theorems (Std. 2.10)

Unit 3: Functions and their graphs (Std. 2.1), transformation and inverse of functions (Std. 2.3), reciprocal of a function (Std. 2.4), quadratic functions (Std. 2.5), inequalities (Std. 2.9)

Unit 4: Introduction to the principles of calculus, derivatives of x^n , derivative as a rate of change (Std. 7.1), derivative of a sum and real multiple, chain rule, product and quotient rules, 2nd and higher derivatives (Std. 7.2), local maxima and minima, max/min problems (Std. 7.3), kinematics with derivatives (Std. 7.6), graphical behavior of tangents and normals, points of inflexion (Std. 7.7)

Unit 5: Indefinite integration of polynomials, simple u -substitutions (Std. 7.4), definite integrals, area under a curve and volumes of revolution (Std. 7.5), kinematics with integration (Std. 7.6), implicit differentiation (Std. 7.8)

Unit 6: Exponents and logarithms, laws of logarithms, change of base (Std. 1.2), graphs of exponential functions (Std. 2.7), natural logarithms and exponential functions (Std. 2.8), calculus of exponential functions (Stds. 7.1-7.7)

Unit 7: Radian measure, arc length and area of a sector (Std. 3.1), trigonometric functions (Std. 3.2), compound and double angle identities (Std. 3.3), graphs of trigonometric functions (Std. 3.4), solution of trigonometric equations (Std. 3.5), solution of triangles (Std. 3.6), calculus of trigonometric functions (Stds. 7.1-7.7)

Unit 8: Definition of a matrix (Std. 4.1), matrix operations (Std. 4.2), determinant and inverse of a matrix (Std. 4.3), solution of systems of linear equation using matrices (Std. 4.4)

Unit 9: Definition and notation of vectors (Std. 5.1), scalar product of two vectors, angle between two vectors (Std. 5.2), vector equation of a line (Std. 5.3)

Grading Scale for IB Math Examinations

F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
0	31	35	39	43	47	51	55	61	66	72	78	83